

## Opinion

### Potential role of *Nigella Sativa* in the treatment of opioid dependence: An overview

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## Abstract

Thymoquinone (TQ) is the main pharmacologically active compound found in the seeds oil of *Nigella Sativa*. Various studies had been investigated on the therapeutic effects of TQ against several diseases such as anticancer research, antibacterial, and so on. As a result, a considerable amount of information has been generated from these researches thus providing a better understanding of the promising effects of this compound. However, research studies on the potential role of this compound on opioid addiction studies are still lacking. Therefore, the purpose of this paper is to highlight the potential role of TQ as a non-opioid substitution therapy in opioid addiction and the chances of this compound to be explored further with special attention to opioid substitution therapy.

**Keywords:** *Nigella sativa*, opioid addiction, thymoquinone

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*Nigella Sativa* Linn (NS) is belongs to family Ranunculaceae. The herb is widely known in different parts of the world and its seeds are normally be used as condiments. In subcontinent it is known as 'kalonji' and its Arabic name is 'Habbatul Sauda'. In the west it is known as "Black Cumin". There is a Hadith of Hazrat Muhammad (PBUH) stated that, 'black seed is treatment of every disease but death'<sup>[1,9]</sup>. With referenced to this hadith, most of the Muslims used black seeds (figure 1) for different varieties of ailments. For example, it has been used for asthma, chronic headache, migraine, chest congestion, infection, paralysis, backpain, gastrointestinal problems and diarrhea in Arab folk and in South Asia<sup>[2]</sup>.

This herb possesses several main active compounds that might contribute to their promising effects on various kinds of ailments. Among their most important active compounds are thymoquinone (30-48%), thymohydroquinone, dithymoquinone, p-cymene (7-15%), carvacrol (6-12%), 4-terpineol (2-7%) and t-anethol (1-4%)<sup>2</sup>. Other study also reported thymoquinone to be one of the main pharmacologically active constituents of the *N. sativa* volatile oil in addition of dithymoquinone, thymohydroquinone and thymol<sup>[3]</sup>. It has been widely said that most of the pharmacological properties of *N. sativa* are mainly comes from quinone constituents in which thymoquinone is the most abundant<sup>[2]</sup>. Specific chemical analysis using high performance liquid chromatography of the seeds oil of *N. sativa* had also revealed that thymoquinone may attain from 1.65% up to 27.8% of the *N. sativa* volatile oil (w/w) composition<sup>[4,5]</sup>.

Recently, a great deal of attention has been given to this pharmacologically active quinone. Many therapeutic potential of thymoquinone in a number of medical conditions has been reported worldwide<sup>[6]</sup>. It was reported that thymoquinone has anticancer effects<sup>[7]</sup>, antibacterial activity<sup>[8]</sup>, analgesic effects and many more<sup>[9,10]</sup>. Study from Sangi *et. al* further demonstrated that the usage of calcium channel blockers have been proved to be effective in controlling opioid withdrawal syndromes. Total 35 known addicts of opiates were included in their study based on DSM IV criteria for opioid dependence and they were blindly given *Nigella sativa* 500mg during the treatment. As a result, the study demonstrates that non opioid treatment for opioid addiction decreases the withdrawal effects significantly. It further demonstrates that there are no changes in physiological parameters of the subjects during treatment (BP, Pulse rate etc.). There is an increase in their appetite but no significant weight gain was reported in the subjects. Thus, non-opioid drug *Nigella sativa* is concluded to be effective in long term treatment of opioid dependence. It is not merely cures the opioid dependence but also cures the infections and weakness from which majority of addicts suffer.<sup>[11]</sup>

Later, it was found that thymoquinone also exhibits calcium channel blocker properties<sup>[6]</sup>, driving its further research in reducing opioid dependence. A study conducted

in morphine-induced mice had shown that thymoquinone can also attenuate the development of morphine-induced dependence in mice by inhibiting brain oxidative stress and increasing the expression of brain inducible nitric oxide (NO) synthase<sup>[12]</sup>.

Addressing this situation, thymoquinone has been reported to have wide therapeutic potentials but yet there is number of other pharmacological studies need to be explored in medical field for better solutions for example in controlling opioid withdrawal syndromes, craving of opioid and opioid dependence. Approach using thymoquinone in this unresolved issues of opioid might be beneficial in terms of adding scientifically reliable data on potential role of thymoquinone on opioid addiction studies.



**Figure 1.** *Nigella sativa* seeds (black seeds)<sup>[4]</sup>

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